

**The Contribution of Aerosols from Biomass Burning to Climate Change**

Joyce E. Penner, Catherine C. Chuang, Catherine Lioussé, and Karl Taylor

The contribution of aerosols from biomass burning to climate change results from two effects: clear-sky and cloudy-sky forcing. The clear-sky climate forcing by aerosols from biomass burning depends on the relative contribution of scattering and absorption by the aerosols which in turn depends on the fraction of aerosol mass associated with black carbon and its size distribution. In this paper, we review measurements relevant to these parameters and present new estimates of the clear-sky forcing by biomass aerosols, placing these estimates in the context of estimates for clear-sky forcing by anthropogenic sulfate aerosols, anthropogenic sources of black carbon from fossil fuel burning and anthropogenic sources of organic particulate matter from sources that are not associated with biomass burning.

The cloudy-sky forcing from biomass aerosols is more difficult to estimate because, among other factors, it depends on the amount of absorption by biomass aerosols in cloud. The factors controlling the cloudy-sky forcing by biomass aerosols will be reviewed and estimates of the plausible magnitude of the cloudy-sky forcing will be presented.

This work was performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under Contract No. W-7405-Eng-48.